UNITED STATES PATENT AND TRADEMARK OFFICE

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ROSARIO, DENNIS

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 04/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _07 March 2005_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-28_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-28_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _04 December 2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   The amendment was received on March 7, 2005. Claims 1-28 are pending.

Response to Arguments

2.   Applicant's arguments with respect to claims 11 and 13, line 4, filed 3/7/2005 on

page 10, 4th paragraph have been fully considered but they are not persuasive and

states:

"The cytological... system disclosed by Ortyn et al....is not another autofocus

system..."

However, the examiner respectfully disagrees since Ortyn et al. discloses as

claimed in claim 13 an auto-focusing mechanism or "autofocus system" in col. 15, line

58 in Ortyn et al. and shown in fig. 12.

3.   Applicant's arguments, see page 10, 4th paragraph, filed 3/7/2005, with respect to

"first order Gaussian derivative" have been fully considered and are persuasive.

However, the first order Gaussian derivative is not claimed.

4.   Applicant's arguments, see page 10, 6th paragraph, filed 3/7/2005, with respect to

"selection of a suitable filter... during autofocus" have been fully considered and are

persuasive. However, selection of a suitable filter during autofocus is not claimed.

5.   Applicant's arguments, see page 12, line 2, filed 3/7/2005, with respect to "high-pass filter" have been fully considered and are persuasive. However the high-pass filter is not claimed.

6.   Applicant's arguments on page 11,lines 8,9,14 and 15/2005 have been fully considered but they are not persuasive and states:

"...the...filter includes a smoothing filter where the spatial extent (smoothing size) of the filter is settable...In contrast...Ortyn et al. does not disclose smoothing with a settable size."

However, the examiner respectfully disagrees since upon further consideration Ortyn et al. discloses a filter that includes a smoothing filter (that transforms one signal as shown in fig. 20 to a smoothed signal as shown in fig. 21) to where the spatial extent (smoothing size) of the filter is settable (as indicated by "a" and "b" in figures 20 and 21). Note that fig. 20 is in terms of time and fig. 21 is in terms of frequency. However a relationships exists between space and time as shown in fig. 17.

7.   Applicant's arguments, see page 11, 4th paragraph, filed 3/7/2005, with respect to "high-pass filtering with smoothing, and afterward energy operator" have been fully considered and are persuasive. However the high-pass filtering and the energy operator are not claimed.

8.   Applicant's arguments on page 12, line 5 to page 13, line 10 with respect to claim

13, filed 3/7/2005 have been fully considered but they are not persuasive and states in

pertinent part:

> "The digital filter in each claim is defined by a mathematical smoothing function
>
> having a negative and a positive lobe around origin thereof. Ortyn et al. does not
>
> disclose this feature"

However, the examiner respectfully disagrees since upon further review Ortyn et

al. discloses a digital filter (whose response is shown in fig. 21) in each claim is defined

by a mathematical smoothing function (or a transformation from fig. 20 to fig. 21) having

a negative and a positive lobe around origin thereof (as shown by the sinusoidal

response on both sides of the origin).

9.   Applicant's arguments on page 13, last paragraph to page 14 or 15,line 5 filed

3/7/2005 have been fully considered but they are not persuasive and states in pertinent

part:

> "...the method and apparatus of the claimed invention...completely adapt to
>
> the... times at which images are captured...This feature is not disclosed by Ortyn
>
> et al."

However, the times at which images are captured is not claimed in claim 4.

Claim Rejections - 35 USC § 102

10.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11.   Claims 1-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Ortyn et

al. (US Patent 5,841,124 A).

Regarding claim 1, Ortyn et al. discloses a method of autofocus of an optical

instrument for viewing an object and having an auto-focusing mechanism, comprising

the steps of:

Step 1: acquiring a first digital image (fig. 14, num. 316 receives an image via

arrow 310) of the object (Oval shape next to numeral 508.) through the optical

instrument (Fig. 14, num. 302 has magnification modes), the first digital image (fig. 14,

num. 316) comprising a plurality of pixels having pixel values (The first image is formed

from a CCD array of a camera as mentioned in col. 17, lines 48-52.);

Step 2: applying a digital gradient filter ("spectral filter" in col. 19, line 27) to at

least some of the pixel values of the first digital image to obtain a focus score (Fig.

13:"FOCUS SCORE") for the first digital image; wherein the digital gradient filtering step

includes a smoothing operation (or a "transformation" in col. 19, line 21 from fig. 20 to

fig. 21) having a settable spatial extent (Fig. 20, "a" or "b" corresponds to distances that

are set using a "size range" in col. 19, line 1.).

Regarding claim 2, Ortyn discloses the method of claim 1, wherein the spatial

extent (Fig. 20, "a" or "b" distance or range is selected filtering as mentioned in col. 19,

lines 21-28.) of the smoothing function ("low pass filtering" is used with the filter 540 of

fig. 14. as mentioned in col. 19, line 57.) is manually and/or electronically settable (The

spatial extent or range is "designed using conventional techniques" in col. 19 , lines 33-

36).

Regarding claim 3, Ortyn et al. discloses a method of autofocus for an optical

instrument for viewing an object and having an auto-focusing mechanism, comprising

the steps of:

Step 1: acquiring a first digital image (fig. 14, num. 316 receives an image via

arrow 310) of the object (Oval shape next to numeral 508.) through the optical

instrument (Fig. 14, 302 has magnification modes), the first digital image (fig. 14, num.

316) comprising a plurality of pixels having pixel values (The first image is formed from

a CCD array of a camera as mentioned in col. 17, lines 48-52.);

Step 2: applying a digital filter ("spectral filter" in col. 19, line 27) to at least some

of the pixel values of the first digital image to obtain a focus score (Fig. 13:"FOCUS

SCORE") for the first digital image; wherein the digital filter is defined by a mathematical

smoothing function (as shown in fig. 21) having a negative and positive lobe (or a

sinusoidal response as shown in fig. 21) around the origin thereof (or where the

sinusoidal response is around the origin), the mathematical smoothing function having

only one zero crossing (as indicated by "~1/b" in fig. 21) and being limited in spatial

extent in that it extends (or "increased" in col. 19, line 2) over a distance equal to the

image size (fig. 16, label: "D") and extends at least over three pixels (from a size of "19

pixels" in col. 18, lines 65,66 to a size of "22 pixels" in col. 19, lines 3,4 of fig. 16, label

"D") either side of a pixel (or any pixel in fig. 16,num. 904) whose value is being filtered.

Regarding claim 4, Ortyn et al. discloses the method according to claim 1, further

comprising:

Step 3: moving the object (Oval shape next to numeral 508 is placed on a slide

that is moved for each image signal as mentioned in col. 22, lines 8-14.) relative to the

optical instrument (Fig. 14, num. 302 has magnification modes) along the optical axis

(Fig. 14 has an optical axis shown by an arrow 110 and another arrow going out of 302.)

thereof and acquiring a second digital image (Fig. 14, num. 316 is a camera as

mentioned in col. 17, line 63) and a second focus score therefor (The camera of fig. 14,

num. 318 is a focus minus camera that obtains focus scores shown in fig. 13 as the F⁻

curve.) in accordance with the method of steps 1 and 2 (The method of steps 1 and 2

are repeated for additional images of step 3.) ;

Step 4: continue moving the object (Oval shape next to numeral 508 is placed on a slide that is moved for each image signal as mentioned in col. 22, lines 8-14.) relative to the optical instrument (Fig. 14, num. 302 has magnification modes) along the optical axis thereof (Fig. 14 has an optical axis shown by an arrow 110 and another arrow going out of 302.) in the same direction in accordance with steps 1 to 3 to acquire at least three digital images (Fig. 14, numerals 314-318 are three cameras that obtains 1 image each for a total of three images as mentioned from col. 17, line 48 to col. 18, line 5.) and first to third focus scores (fig. 13 as three functions that correspond to the three images which each contain a respective focus score.) associated therewith; and

Step 5: determining from the first to third focus scores (fig. 13 as three functions that correspond to the three images which each contain a respective focus score.) a focus position ("0" on the Z POSITION OF SPECIMEN axis is a focused position as mentioned in col. 16, lines 64-66. Note the "0" position corresponds to two focus signals that are "equal" to each other as mentioned in col. 16, line 66.) for the object (Oval shape next to numeral 508) and moving (The oval shape, which is on a slide, is moved for proper focusing as mentioned from col. 16, lines 62 to col. 17, line 4.) the object (Oval shape next to numeral 508) and/or the optical instrument to this position (Fig. 14, num. 302 has magnification modes).

Claim 5 is similar to claim 4, except for step 3 that is disclosed by Ortyn et al.:

Step 3: determining (Normalizing a function F⁻ to determine corresponding

normalized focus scores.) a first plurality of focus scores (Fig. 13 has a plurality of focus

scores for a function F⁻.) for the first digital image (fig. 14, num. 316) using the digital

gradient filter (Fig. 14, num. 540 has a filter, which is shown in detail in fig. 15, num. 404

which produces the score shown in fig. 13) with a first plurality of spatial extents (The F⁻

has a plurality of spatial extents as shown by each position from −15 to +15) by applying

(The method of steps 1 and 2 are performed for one image to obtain 256 focus minus

scores as mentioned in col. 18, lines 32-34.) for each spatial extent (-15 to +15 or 30

spatial extents) the method steps 1 and 2.

Regarding claim 6, Ortyn et al. discloses the method according to claim 1,

wherein the optical instrument is a microscope (Fig. 2, num. 510 is a microscope.)

Regarding claim 8, Ortyn et al. discloses the method according to claim 1,

wherein the digital filtering function ("low pass filtering" is used with the filter 540 of fig.

14. as mentioned in col. 19, line 57.) is a one (Fig. 13 shows a function that

corresponds to the filtering of fig. 14, num. 540 that has one dimension in the "Z

POSITION".) or two dimensional function.

Regarding claim 9, Ortyn et al. discloses the method according to claim 1, wherein the digital filtering function ("low pass filtering" is used with the filter 540 of fig. 14. as mentioned in col. 19, line 57.) is a Gaussian function (Fig. 13 shows a normalized function with triangle marks and a corresponding equation in figure 13 that is mentioned in col. 21, lines 1-6 that corresponds to the filtering of fig. 14, num. 540. Note that the specification states that a Gaussian function is "normal Gaussian curve" on page 12, line 2. Thus the normalized function with triangle marks in fig. 13 is a normal Gaussian curve.)

Regarding claim 10, Ortyn et al. discloses the method according to claim1, further comprising the step of selecting the spatial extent (Fig. 20, "a" or "b" distance is selective filtering as mentioned in col. 19, lines 21-28.). of the digital filtering function ("low pass filtering" is used with the filter 540 of fig. 14. as mentioned in col. 19, line 57.).

Claim 11 is rejected the same as claim 1. Thus, argument similar to that presented above for claim 1 of a method is equally applicable to claim 11 of an instrument except for the additional limitation of an auto-focusing mechanism which is disclosed in Ortyn et al.: "autofocus system" in col. 15, line 58.

Claim 12 was addressed in claim 2.

Claim 13 has been addressed in claims 3 and 11.

Regarding claim 14, Ortyn et al. discloses the optical instrument according to claim 11, further comprising:

a drive device (fig. 1A, num. 526:MOTOR DRIVERS) for moving the object (fig. 16) relative to the optical instrument (fig. 1A, num. 516:IMAGE CAPTURE & FOCUS (ICF)) along the optical axis thereof (fig. 2 is a detail of the ICF of fig. 1A, num. 516 that has an optical axis 110).

Regarding claim 15, Ortyn et al. discloses the optical instrument (fig. 1A, num. 516:IMAGE CAPTURE & FOCUS (ICF)) according to claim 11, the instrument being further adapted for determining from a plurality of focus scores (Fig. 13 has a plurality of focus scores on a vertical axis for three functions, F^-, F^+ and F) for a plurality of images (F^-, F^+ corresponds to two images) a focus position for the object (The function F is the final focused image based on the other two functions).

Regarding claim 16, Ortyn et al. discloses the optical instrument according to claim 15 further adapted for fitting ("normalized" functions of fig. 13 are adjusted to fit in a score range on the vertical axis.) the plurality of focus scores (Fig. 13 has a plurality of focus scores on a vertical axis for three functions, F^-, F^+ and F) to a polynomial function (The function of fig. 133 with square marks.) and determining the focus position (-5 on the Z POSITION AXIS) as a position to a maximum (-5 of the Z POSITION AXIS corresponds to a maximum score of 1 on the vertical axis.) of the polynomial function (The function of fig. 13 with square marks.)

Regarding claim 17, Ortyn et al. discloses the optical instrument (Fig. 1A, num. 516:IMAGE CAPTURE & FOCUS (ICF)) according to claim 15, the instrument being adapted to determine for each image a plurality of focus scores (Fig. 13 has a plurality of focus scores on a vertical axis for three functions, F^-, F^+ and F that correspond to three images.) using a plurality of spatial extents (The function of F^- and F^+ each have a range from −15 to +15 on the Z POSITION OF SPCIMEN axis.) for the digital filter (Fig. 14, num. 540 has a filter shown in detail in fig. 15).

Claims 18 and 25 were addressed in claim 8.

Claims 19 and 26 were addressed in claim 9.

Claim 20 was addressed in claim 6.

Claims 21 and 23 were addressed in claim 12.

Claim 22 was addressed in claim 11.

Claim 24 was addressed in claims 11 and 3.

Claim 27 was addressed in claim 15.

Claim 28 was addressed in claim 16.

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Deck (US Patent 5,208,451 A) is pertinent as teaching a method of teaching a "BEST FOCUS" as shown in fig. 2a.
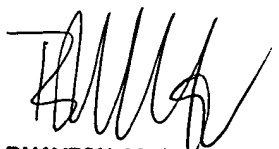
Nagasaki et al. (US Patent 5,083,150 A) is pertinent as teaching a method of focusing with lobes as shown in figures 29A-E.

13.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Dennis Rosario whose telephone number is (571) 272-

7397. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

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Business Center (EBC) at 866-217-9197 (toll-free).

DR
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